

REMARKS

Claims 4-9 are pending in this application and stand rejected. Both the specification and claim 4 have been revised. Claim 4 is independent.

The Examiner is thanked for the telephonic interview with the undersigned conducted on January 31, 2007. This Amendment generally has been prepared along the lines of that telephonic interview. However, upon further reflection, Applicants conclude that in view of the changes made herein, it is not necessary also to alter the claim language providing that the liquid supplying needle of a liquid ejecting apparatus is inserted into the hollow part having a liquid supplying opening.

As explained during the telephonic interview, the specification has been revised slightly to correct two minor typographical errors.

No new matter has been added by any of changes made by this Amendment.

The Rejection Under 35 U.S.C. § 103

Claims 4-9 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,170,939 to Ujita et al. and U.S. Patent No. 6,634,738 to Shinada et al.¹ Applicants respectfully traverse this rejection and submit the following arguments in support thereof.

¹ As previously noted, Shinada is commonly assigned along with the present application. To the extent this response discusses Shinada, such discussion involves the general teachings of that reference, and should not necessarily be construed to limit the scope of the claims of Shinada or its counterparts. If Shinada is characterized as teaching a particular feature or mode of operation, the claims of that reference and its counterparts should not necessarily be construed to require that feature or mode of operation unless the feature or mode of operation is specifically recited in the claims.

As described in claim 4, Applicants' invention involves a liquid cartridge that includes a liquid accommodating chamber for containing liquid, a hollow part having a liquid supplying opening, into which a liquid supplying needle of a liquid ejecting apparatus is inserted, while the liquid supplying opening communicates with the liquid accommodating chamber, a seal member contained in the hollow part, this seal member having an insertion opening being in elastic contact with an external circumference of the liquid supplying needle, while the liquid supplying needle is inserted to the insertion opening, a supply valve contained in the hollow part, this supply valve being arranged in order to close or open the seal member's insertion opening, and an urging member for urging the supply valve toward the seal member. The supply valve has a body part of circular cross-section, and diameter that is substantially uniform, of which the diameter is substantially the same as a diameter of the hollow part of the liquid supplying part, and having a cylindrical shape, of which the length in the sliding direction is greater than the diameter of the hollow part of the liquid supplying part. A taper part is formed at a first end of the body part, this taper part having an end engaged with the urging member, and a bottom face is formed at a second end of the body part, the bottom face having a flat surface being in contact with the seal member.

By virtue of this structure it is easy to assemble the ink cartridge, as the specification explains, for example, at paragraphs [0059]-[0067].

Various aspects of the claimed invention will be particularly clear in view of Figs. 9-11, and the corresponding portions of the specification such as paragraph [0065]. As taught therein, and by way of non-limiting example, one benefit of this invention is that it makes cartridge assembly easier (the specification also points out other assembly techniques are

possible). To do this, spring 14 is inserted into the hollow part 34 through hole 32 of the ink supply section 160. Then, the seal member 12 is placed into the ink supplying hole 32 (the specification noted that the seal thereby retains the spring in place). Next, the supply valve 13, which has a taper part 510 at its leading end, is pushed into and through the insertion opening 26 of the seal member 12. Due to the shape of the supply valve, the supply valve dilates and passes through the seal member 12 and contacts spring 14. As shown in Fig. 11, the seal then returns to its previous shape and keeps the supply valve 13 in place.

The cited combination of references does not suggest either these claimed structures or the benefits which may be obtained from such structures.

Ujita fails to suggest various aspects of the claimed invention. Ujita teaches that an O-ring 307 is located on the ink feed pipe 315 of the recording head 301 and that the O-ring fits into a region of the ink tank cartridge 303 (Figs. 5-6; col. 20, lines 16-20). Ujita therefore does not teach or suggest the aspects of this invention which involve the seal contained in the hollow part into which a liquid supplying needle of a liquid ejecting apparatus is inserted. Also, whereas this invention provides that the seal member has an insertion opening being in elastic contact with an external circumference of the liquid supplying needle, meaning contact between the seal and needle occurs only when the cartridge is mounted on the liquid ejecting apparatus, in Ujita the O-ring 307 is in contact with the ink feed pipe 315 (which the Office Action appears to regard as corresponding to the ink supply needle) even before the head is attached to the tank.

Nor does Ujita suggest the aspect of claim 4 providing that the body part has a bottom face with a flat surface that is in contact with the seal member. As shown in Figs. 5 and 6, Ujita's valve body 306 has a raised annular sealing portion 313 which presses against the valve

body receiving portion 314 that surrounds insert hole 321 in the cartridge 303. In other words, Ujita's valve body has a raised area that presses against a wall of the container. This in no way suggests the aspects of the present invention providing that the flat surface of the body part contacts the seal member. Since Ujita's O-ring 307 arguably is comparable to the claimed seal member (col. 20, lines 35-42), for Ujita to suggest the claimed invention Ujita would have to teach the valve body 306 touches the O-ring 307, which Ujita does not.

The Office Action, recognizing this, looks to Shinada to remedy Ujita's deficiencies. However, Shinada, as noted above, teaches an ink cartridge that is attached to a printer, not a recording head, and so Shinada is not properly combined with Ujita, which teaches a tank/printhead combination.

Even if Shinada is combined with Ujita, that combination would lead away from the present invention because all of Shinada's teachings must be considered, not just those that may support the asserted rejection. Shinada has a valve body 65 which in no way resembles that of the claimed invention. This invention provides for a cylindrical body part of circular cross-section, and diameter that is substantially uniform, the diameter being substantially the same as the diameter of the hollow part, and a taper part being formed at a first end of the body part. Shinada's valve body differs markedly from that, and has an enlarged head, a narrow body, and a slightly flared other end, and is not cylindrical. Also, as shown in Fig. 5 of Shinada, the valve body 65 is not substantially the same diameter as the opening in which it is located. So Shinada's valve body teaches away from all these aspects of the claimed valve body.

Shinada also differs from the present invention because of how Shinada's spring 64 is attached to the valve body 65. Whereas claim 4 states that taper part at the first end of the

body part is engaged with the urging member, and that there is a flat surface at the second end of the body part that contacts the seal member (see, for example, Figs. 9 and 11), in Shinada the spring is attached to the **same** end of the valve body 65 that the spring 64 is joined to. So Shinada teaches the very **opposite** of the claimed invention.

Each of these aspects of Shinada would lead one skilled in the art away from the invention as claimed herein. Thus, regardless of whether Shinada is applied as a secondary reference along with Ujita, or as a primary reference in combination with Ujita, all the features of the claimed invention still are not suggested.

The remaining rejected claims, claims 5-9, all ultimately depend from and so incorporate by reference all the features of independent claim 4, which features have been shown to patentably distinguish over the cited art. These dependent claims therefore are patentable over the cited art at least for the same reasons as claim 4.

For all the foregoing reasons, favorable reconsideration and withdrawal of this rejection are respectfully requested.

CONCLUSION

Applicants respectfully submit that all outstanding rejections have been addressed and are now overcome. Applicants further submit that all claims pending in this application are patentable over the prior art. Favorable reconsideration and withdrawal of those rejections and objections is respectfully requested.

No fees are believed to be due in connection with the filing of this paper. If, however, the Commissioner deems any fees to be now or hereafter due, the Commissioner is authorized to charge all such fees to Deposit Account No. 19-4709.

In the event that there are any questions, or should additional information be required, please contact Applicants' attorney at the number listed below.

Respectfully submitted,

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